AMENDMENTS TO THE CLAIMS

The following list of claims replaces all prior lists and versions of claims:

Claim 1 (Currently Amended): A method for the ~~prophylaxis or~~ treatment of infection by a microorganism in a biological environment from where the microoganism acquires iron, heme or porphyrin said method comprising administering to said environment an effective amount of an agent for a time and under conditions sufficient to antagonize the interaction between a molecule derived from said microorganism having an HA2 domain and an HA2-binding motif on a porphyrin containing molecule present in said biological environment.

Claim 2 (Original): A method according to Claim 1 wherein the microorganism is *Porphyromonas gingivalis* or a related microorganism.

Claim 3 (Previously Presented): A method according to claim 1 wherein the biological environment is a mammal or reptile or insect or bird or species of fish.

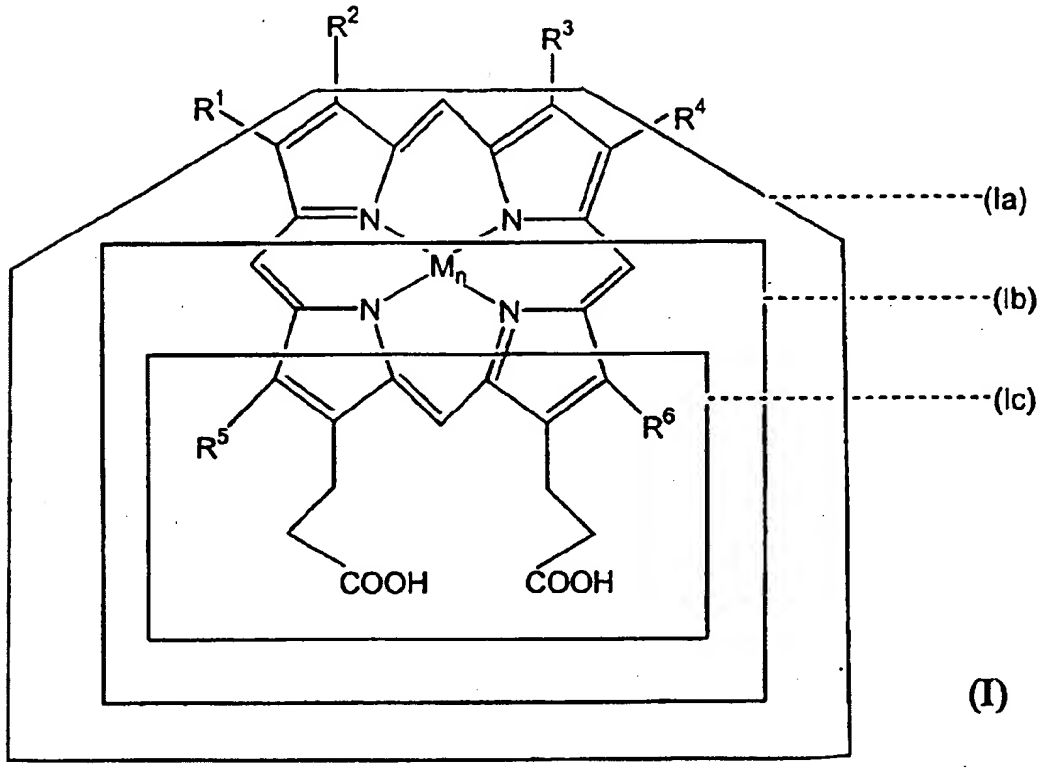
Claim 4 (Original): A method according to Claim 3 wherein the mammal is a primate, human, livestock animal or a companion animal.

Claim 5 (Original): A method according to any one of Claims 1 to 4 when used for the treatment of a disease condition in the oral cavity, nasopharynx, oropharynx, vagina or urethra or other vascular or mucosal regions or cavities or in the hooves of livestock animals.

Claim 6 (Currently Amended): A method according to any one of Claims 1 to 4 wherein the HA2-containing molecule is a gingipain, an hagA gene product or a TonB-dependent protein ~~such as but not limited to Tla protein~~ or a homologue thereof.

Claim 7 (Previously Presented): A method according to Claim 1 wherein the porphyrin moiety is a heme.

Claim 8 (Currently Amended): A method according to Claim 7 wherein the HA2-binding motif comprises a region comprising or within substructure (Ic) of structure (I):



(I)

wherein R_1 and R_6 are the same or different and each is an alkyl such as a methyl, ethyl or propyl group, or hydrogen, hydroxyl, carboxyl, aldehyde, acetaldehyde or keto group, M is a metal ion in various oxidation states ~~such as but not limited to Fe, Fe^{++} and Fe^{+++}~~ and is optionally present such that n is 0 or 1 or a structurally or functional homologue thereof.

Claim 9 (Currently Amended): A method for the prophylaxis or treatment of infection by a microorganism in a mammal, said microorganism substantially requiring exogenous iron, heme or porphyrin for growth or maintenance wherein said method comprises administering to said

mammal an effective amount of an agent for a time and under conditions sufficient to antagonize the interaction between a molecule derived from said microorganism and having an HA2 domain and an HA2-binding moiety on a porphyrin-containing molecule ~~such as but not limited to hemoglobin or a precursor form thereof or part thereof such as heme~~ and wherein said HA2 domain comprises:

(i) an amino acid sequence substantially encoded by the nucleotide sequence set forth in ~~<400>5~~ SEQ ID NO:5 or a nucleotide sequence having at least about 40% similarity thereto or capable of hybridizing thereto under low stringency conditions comprising from at least about 0 to at least about 15% v/v formamide and from at least about 1M to at least about 2M salt; and/or

(ii) an amino acid sequence substantially as set forth in ~~<400>6~~ SEQ ID NO:6 or an amino acid sequence having at least about 40% similarity thereto or at least about 20% identity after optimum alignment with same sequence.;

wherein said amino acid sequence is capable of interacting with an HA2-binding moiety on a porphyrin-containing molecule such as but not limited to hemoglobin or a precursor form thereof or part thereof such as heme.

Claim 10 (Original): A method for prophylaxis or treatment of peridontal, pulmonary, vaginal, urethral or hoof disease resulting from infection by *P. gingivalis* or related microorganism in a mammal said method comprising administering to said mammal an effective amount of a agent for a time and under conditions sufficient to antagonize the interaction between a *P. gingivalis*-derived moelcule having an HA2 domain and an HA2-binding motif on hemoglobin.

Claim 11 (Currently Amended): A method for the prophylaxis or treatment of *P. gingivalis* infection or infection by a related microorganism in a mammal, said method comprising administering to said mammal an effective amount of an agent for a time and under conditions sufficient to antagonize the interaction between a *P. gingivalis*-derived HA2-containing molecule

comprising the amino acid sequence ALNPDNYLISKDVTG~~<400>1~~ SEQ ID NO:1 or ALNPDNYLISKDVTGATKVKY ~~<400>8~~ SEQ ID NO:8 or an amino acid sequence having at least 40% similarity to ~~<400>1 or <400>8~~ SEQ ID NO:1 or SEQ ID NO:8 or at least about 20% identity after optimum alignment with same sequence or an amino acid sequence encoded by the nucleotide sequence~~<400>7~~ SEQ ID NO:7 or a nucleotide sequence having at least 40% similarity thereto or a nucleotide sequence capable of hybridizing thereto under low stringency conditions and an HA2-binding motif comprising and including propionic acid groups or anionic or salt forms thereof ~~such as but not limited to the region defined by substructure (Ic) in Formula (I) on a porphyrin-containing molecule such as but not limited to hemoglobin or a precursor form thereof or part thereof such as heme~~.

Claim 12 (Withdrawn): An agent capable of antagonizing interaction between an HA2-containing molecule and an HA2-binding motif on a porphyrin-containing molecule such as but not limited to hemoglobin or a precursor form thereof or part thereof such as heme.

Claim 13 (Withdrawn): An agent according to Claim 12 wherein the porphyrin is heme.

Claim 14 (Withdrawn): An agent according to Claim 12 or 13 wherein said agent comprises propionic groups in planar alignment with respect to the molecular structure of said agent.

Claim 15 (Withdrawn): Use of a gingipain or an HA2 domain containing part thereof or an HA2-containing molecule in the manufacture of a medicament for the prevention or treamtent of *P. gingivalis* infection or infection by a related microorganism.

Claim 16 (Withdrawn): Use of an antagonist of *P. gingivalis*-derived HA2-containingmolecule interaction with a porphyrin-containing molecule such as but not limited to hemoglobin or a precursor form thereof or part thereof such as heme in the manufacture of a medicament for the prophylaxis or treatement of *P. gingivalis* infection or infection by a related microorganism.

Claim 17 (Withdrawn): A therapeutic composition comprising an agent according to Claim 12 or 13 and one or more pharmaceutically acceptable carriers and/or diluents.

Claim 18 (Previously Presented): A method according to claim 5 wherein the HA2-containing molecule is a gingipain, an hagA gene product or a TonB-dependent protein such as but not limited to Tla protein or a homologue thereof.

Claim 19 (Previously Presented): A method according to claim 6 wherein the porphyrin moiety is a heme.

Claim 20 (Withdrawn): A therapeutic composition comprising an agent according to claim 14 and one or more pharmaceutically acceptable carriers and/or diluents.

Claim 21 (New): A method according to claim 6, wherein the TonB-dependent protein is a Tla protein.

Claim 22 (New): A method according to claim 8, wherein the metal ion M in various oxidation states is selected from the group consisting of Fe, Fe^{++} and Fe^{+++}.

Claim 23 (New): A method according to claim 9, wherein the molecule derived from said microorganism and having an HA2 domain and an HA2-binding moiety on a porphyrin-containing molecule is hemoglobin or a precursor form thereof or part thereof or heme.

Claim 24 (New): A method according to claim 11, wherein the HA2-binding motif comprising and including propionic acid groups or anionic or salt forms thereof is defined by substructure (Ic) in Formula (I) on a porphyrin-containing molecule.

Claim 25 (New): A method according to claim 24, wherein the porphyrin-containing molecule is hemoglobin or a precursor form thereof or part thereof or heme.